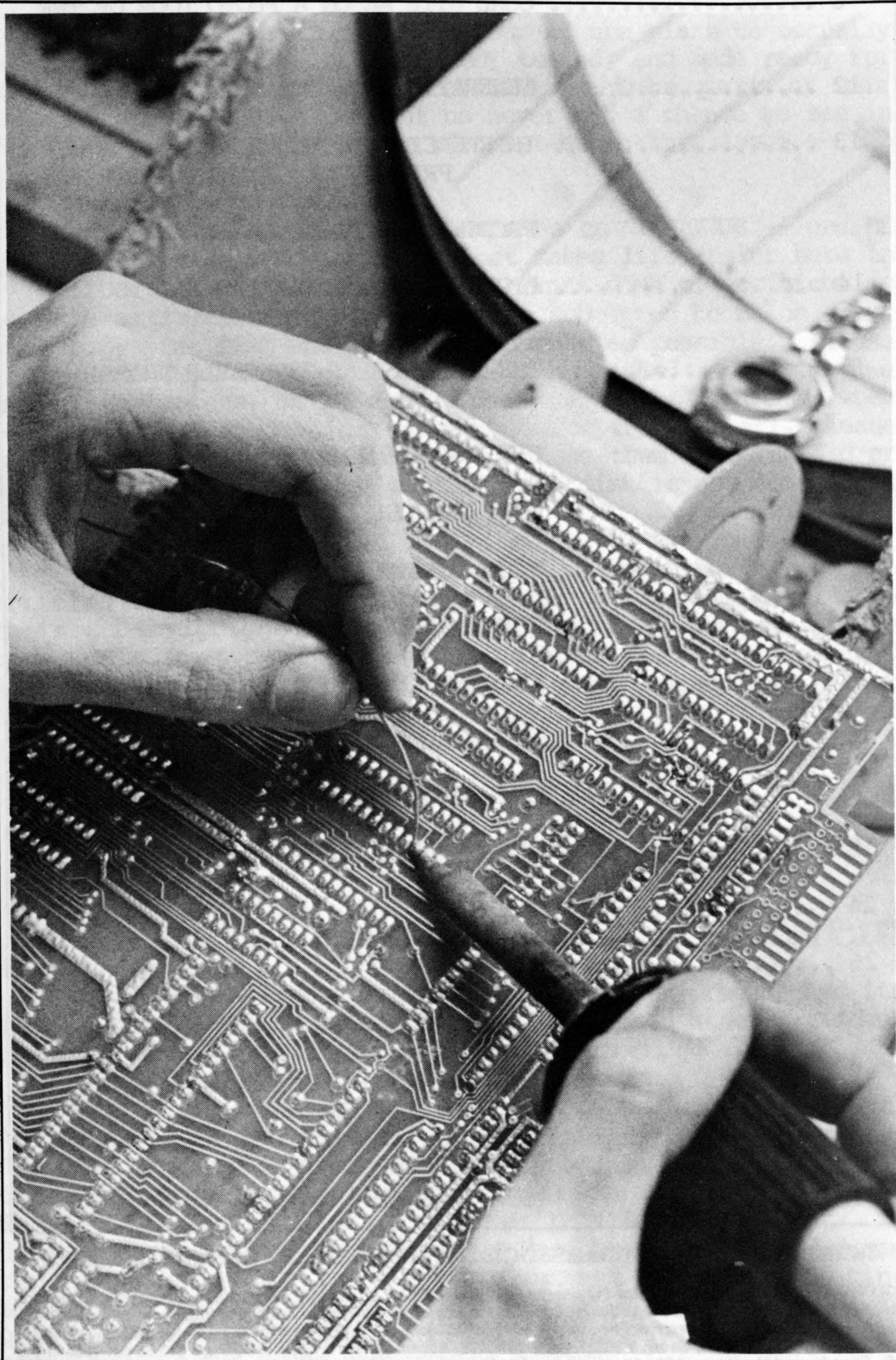


colorcue

a publication for Compucolor users · v.3, · # 3 · march 1980 \$1



inside

- INTERVIEW WITH
COMPUCOLOR'S
NEW PRESIDENT:
PETER CURNIN
- COME ON A PHOTO TOUR
OF THE PLANT
WITH ME
- GENERAL PRINT PROGRAM
- GENERATING BREAKS
- INTERFACING THE
HEATH H-14 PRINTER
- AND MUCH MORE!

colorcUE

**contributing
to the
success
of this issue**

USER INPUT

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Trevor Taylor
James B. Warner

TECHNICAL ADVICE

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menu

3 **EDITOR'S LETTER**

REM

3 **INTERVIEW WITH PETER CURNIN: PART ONE**

8 **COME WITH ME ON A PHOTO TOUR OF THE
PLANT**

12 **GENERATING A BREAK**

13 **INTERFACING THE HEATH H-14 LINE
PRINTER TO THE COMPUCOLOR II**

PRODUCT SHOWCASE

14 **LIGHT PEN AVAILABLE FOR ALL YOU
GRAPHICS FANS!**

15 **THE PRICE OF RS-232 CABLE DROPS!**

USER GROUP HOTLINE

15 **MORE GROUPS!**

USER SOFTWARE FILE

16 **STATUS REPORT**

KEEPING IT SIMPLE

16 **BINARY TO ASCII/ASCII TO BINARY**

ADVANCED APPLICATIONS

18 **GENERAL PRINT PROGRAM**

24 **INPUT**

26 **ATTN/BREAK**

ENCLOSURES

**SUBSCRIPTION AND BACK ISSUE
ORDER FORM**

**COMPUCOLOR USER SOFTWARE FILE
PROGRAM IDENTIFICATION FORM**

—member international association of business communicators—

COLORCUE is published monthly for the users of the Compucolor II personal computer by Compucolor Corporation, P.O. Box 569, Norcross, Georgia 30071. Compucolor is a wholly owned subsidiary of Intelligent Systems Corp. Address all COLORCUE correspondence to our editorial office located at 100 Northcreek, Suite #250, 3715 Northside Parkway, N.W., Atlanta, Georgia 30327, (404) 261-3003. Subscriptions to COLORCUE are \$12.00 per year in the U.S., Canada, and Mexico, and \$24.00 elsewhere. ©1980 Compucolor Corporation. All rights reserved.

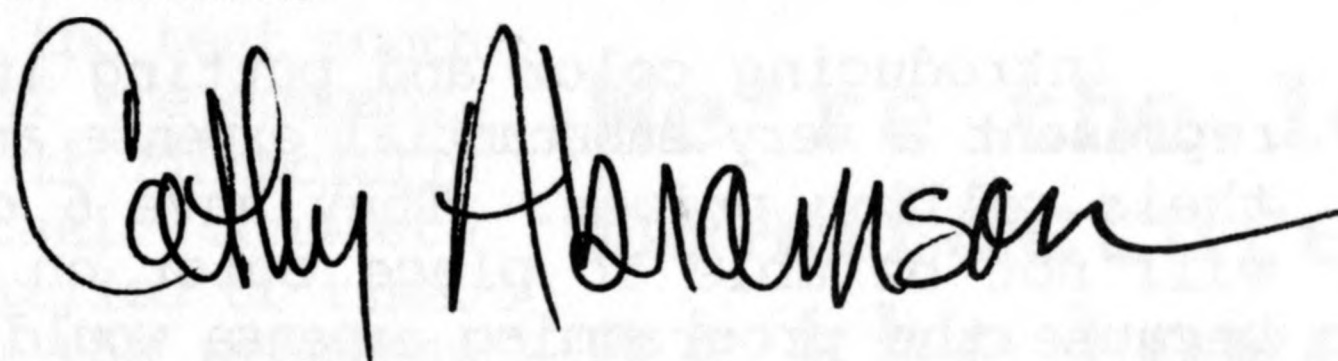
editor's letter

We have a very exciting issue in store for you this month. Compucolor Corporation continues to grow and develop and this month, it is my pleasure to present you with the first of a two-part interview with Peter Curnin, Compucolor's new President. Mr. Curnin comes to us from IBM and I'm sure you'll find this in-depth interview of great interest.

We are also taking a photo tour of the plant to actually see how the Compucolor is assembled, tested, and made ready for shipment -- a fascinating excursion into part of the electronics world that most of us never get a chance to see in person. There's plenty more of interest in this issue -- the focus is on hardware.

A quick note on submitting articles to **COLORCUE** -- one of my favorite topics! One thing that makes life easier here in my office and keeps transcription errors down to a minimum is to have articles and program listings submitted to me on disk. I'll copy your disk and return it as soon as possible. Please include a hardcopy printout of your article in case the unforeseen happens, as it **always** does. A word of warning: when you send disks to me (or to anyone, for that matter), please make sure to pack them carefully. Enclose them in cardboard or some other stiff material so that your disk is not damaged in the mail.

Major Contributors, individuals who have written full articles which have been accepted for publication, will have their subscriptions to **COLORCUE** extended by one year unless they would prefer to trade their article for a preprogrammed disk (of the \$19.95 variety). If you would rather have a disk in trade for your article, please specify in your cover letter which disk you would like in return.



rem

On March 3, 1980, Intelligent Systems Corporation and its subsidiary, Compucolor Corporation, announced a new President and Chief Executive Officer -- Peter Curnin. **INTERVIEW: PETER CURNIN**

Mr. Curnin came to ISC with 23 years of IBM experience. At IBM, he was the project director and marketing strategist for the SCAMP 5100 system -- IBM's foot in the small systems door. Most recently, Mr. Curnin served as manager of IBM's General Systems Division's customer relations department. He developed and managed the Territory Management System, designed to aid management in the development of new marketing strategies and to measure their effectiveness. There is no question that Peter Curnin brings a wealth of knowledge and experience to our young and growing company.

Ezra Mintz, former President of ISC, has been named Chairman of the Board of Directors, and Charles Muench, former Chairman of the Board, remains on the Board to direct ISC's research and development activities.

Before Mr. Curnin really had an opportunity to get his feet wet, we conducted this personal interview with him. It includes some general questions about the future of Compucolor and some very specific questions from a number of you. Due to the length of the interview, we will be presenting it in two parts. Part One covers Compucolor, the company, and its position in the marketplace.



ED: Since IBM was your last employer, I'm sure you have some interesting things to say regarding it's recent announcement of entry into the color field. How do you view IBM's move and how will ISC and Compucolor be affected?

PC: IBM has just recognized the value of color. From ISC's point of view -- that's good. We're the leading

manufacturer, we produce the largest number of units, and we do it at the lowest cost.

Introducing color and putting it into their systems will represent a very substantial expense and should be reflected in their selling prices. They have 6 or 7 product lines. They will not be able to place color on each of these products because the programming expense would be enormous. Color will only be placed on the larger systems, the 370 line and one model System 3, not on smaller units.

ED: How do you feel about Compucolor's current positioning with regard to its other competitors?

PC: We're in the middle of doing a product line assessment right now -- of understanding what is the best strategy to follow over the next three years. Anything you do in this business has to be looked at in the long term perspective. When we look at the Compucolor and Intecolor lines, we will study the relationship between these two and see whether the Compucolor and Intecolor lines can't relate more. One of the things I'd like to see is a product line that walks up the whole series.

ED: So you're talking about merging the two lines together?

PC: No, I'm not. I'm trying to understand what the practicality of that is. Is it a reasonable thing for the engineers and the programmers to accomplish? Is it a desirable thing? How many people would want to move up that flight of stairs? If there is no one who needs to move up, then we won't have to solve a nonexistent problem. On the other hand, perhaps CompuColor users would look forward to being able to add more function to their product. Obviously, we'd like to do that for them. We'd like to add more function to their product -- be the supplier for them.

We want to do some long range planning over the next six months to see exactly how these two lines dovetail. I think if we can accomplish that task, it will give the CompuColor user a whole new perspective. I think to be able to carry him up to a full scale business system would be very interesting and would enhance the value of our product.

I'd like to make the point that IBM continuously studies the function vs. compatibility problem and finds that the answer is a compromise. You find that in order to implement a new function, you create some degree of incompatibility and then you have that hard decision -- do you put that new function in or maintain compatibility? Those are some of the decisions we'll have to face up to.

ED: How do you see the financial status of CompuColor right now?

PC: It's never been stronger. February, and I'm referring now to all of Intelligent Systems, was the best month we've had in the history of the company. The people that we work with financially have reassured us of their complete support for a continuing period of time. They're delighted with the progress we've made and they stand ready to meet any of our future financial needs. Financially, we have no problems on the horizon.

**We're the leading
manufacturer...
at the lowest cost.**

ED: Do you see heavy growth in the future or a more sustained growth pattern?

PC: Obviously, CompuColor and our growth in that area, will be affected by a lot of things outside the company. Namely, what the competition is doing.

ED: Mr. Curnin sees the need to more closely define the "personal computer market".

PC: We want to build more demographics -- find out what part of that market is really business or other shared uses of the personal computer.

ED: Would you like to make a comment on what hardware development projects we're getting into?

PC: It's been a company practice, and I think it's a smart one, not to speculate openly on what we're going to do next. The reasons for that are obvious. You don't want people to wait on a "phantom machine". When you speculate, that often means that you're not promising to deliver. You may stop working on it in a week. That would be very unfair to those people trying to make a buying decision. On the other hand, we are working on projects that we think are quite advanced -- I wouldn't like everybody to know what we're doing.

... we don't want people waiting on a 'phantom machine'.

ED: We have received questions from several of our readers. The first question is from Fred Smith of the University of Georgia, Athens. He says, "We have two machines, an older one and a new one. The new revision boards for the four phase motors are super. The difference is like night and day. Is there anything that can be done to update the boards on older models (for instance, a discount on trade-ins)?" And, Chuck Crawford from the Georgia Users Group asks, "Disks aren't always compatible between machines because disk speed often varies from one machine to the next. What do you intend to do to guarantee disk speed in the future?"

PC: We want to provide both quality and reliability. Both of these areas are being reviewed by our engineering department. We will present the most cost-effective way to upgrade your system at the soonest opportunity. Compucolor is going to grow because we keep our customers happy.

ED: Chris Carson of Aurora, Colorado asks, "What are your plans for expansion, and what are your plans for interfacing hardware and software?"

PC: Interfaces are continuously being examined by our engineers. We are presently working on various interfaces and will make announcements in upcoming issues of **COLORCUE**.

ED: What are your particular strengths for this job? -- Why do you think they chose you?

PC: (Laughing) Well, they didn't really tell me why they chose me. I think, quite frankly, that I come with an awful lot of experience in the marketing area. I graduated from the Wharton School of Business in 1956.

I've been a salesman, and I've run a sales organization. I've been in application development, and I've run development teams. I've done strategy -- and a whole assortment of management jobs. I guess they were interested because I've been successful in each of those jobs. On many occasions, I've been critical of management. Now, I am responsible for making decisions promptly and thoughtfully. That's why I was interested in the job. I feel that my career has always pointed to a position like this one, and that I'm going to learn here as well.

ED: Mr. Curnin has already developed pride and strong personal ties to his new company. He talks about it.

PC: The company is just the right size now. It has all the fundamental things in the right place. The company has doubled in the last year. There aren't many companies around that can make that statement. The one I left couldn't double. The one I left was only growing at 17% a year. I look forward to the kind of growth and vitality that ISC represents.

We have young people here that are running our plants. I think to see an engineer who is able to say, "I developed that product," -- and he did -- well, I think that's terribly exciting; you could let a person start here and all of a sudden find that person growing. Elsewhere, he would not be considered a senior engineer, he'd be a junior. Well, junior is not age, some people are juniors at 50. That same engineer would be working on a ten-man team in a larger company. Watching young people come in and grab hold of these programs is just as exciting as the devil!

. . . I look forward to the growth and vitality that ISC represents.

ED: The big thing that Curnin likes about his new company is the unstructured atmosphere. Coming from highly structured IBM, that's easy to understand.

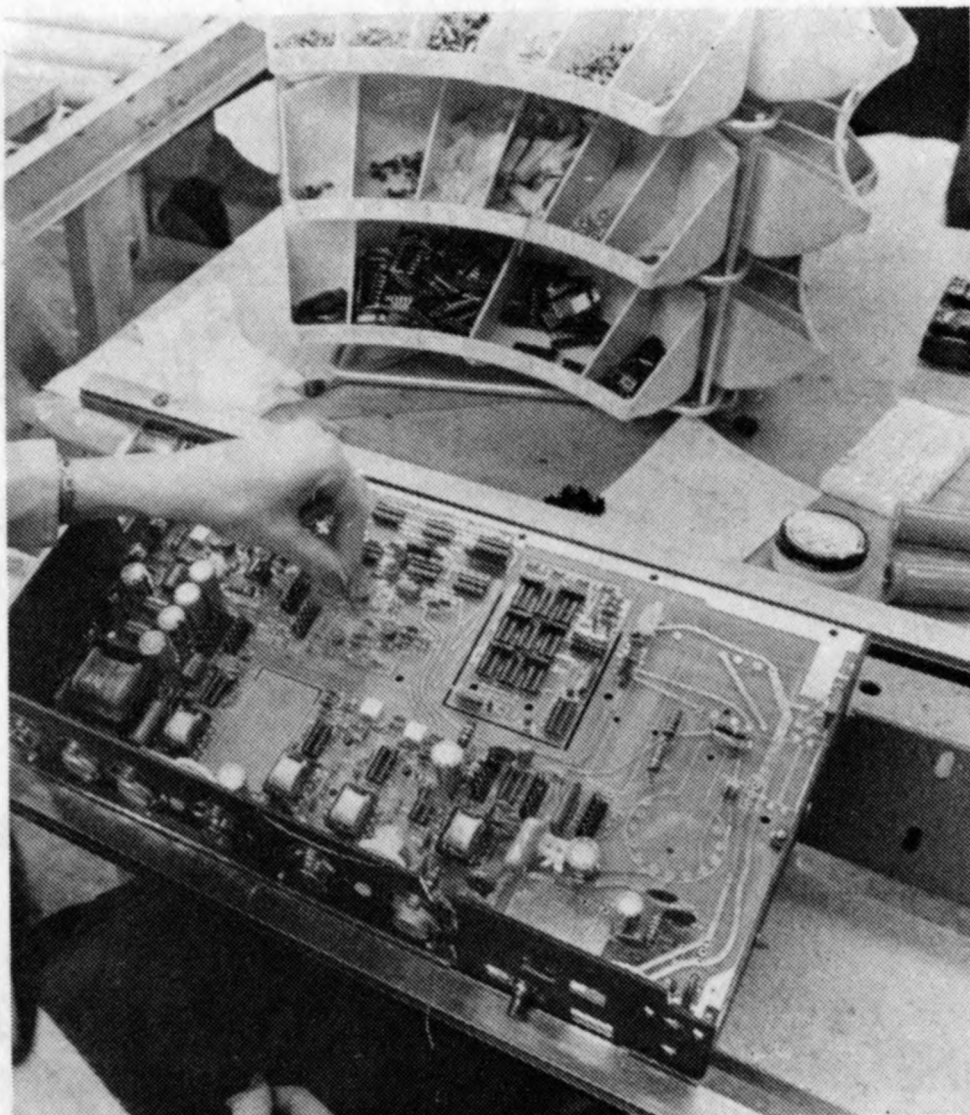
=

Peter Curnin will be discussing support and software development in our next issue of **COLORCUE**, as well as answering a few more user questions. Don't miss Part 2: Interview with Peter Curnin.

=

COME WITH ME ON A PHOTO TOUR OF THE PLANT

Many of you have probably wondered how your Compucolor was made. Since I can't actually walk you through the plant, I walked our photographer through. Come with us and see how the Compucolor is produced.



SUBASSEMBLY:

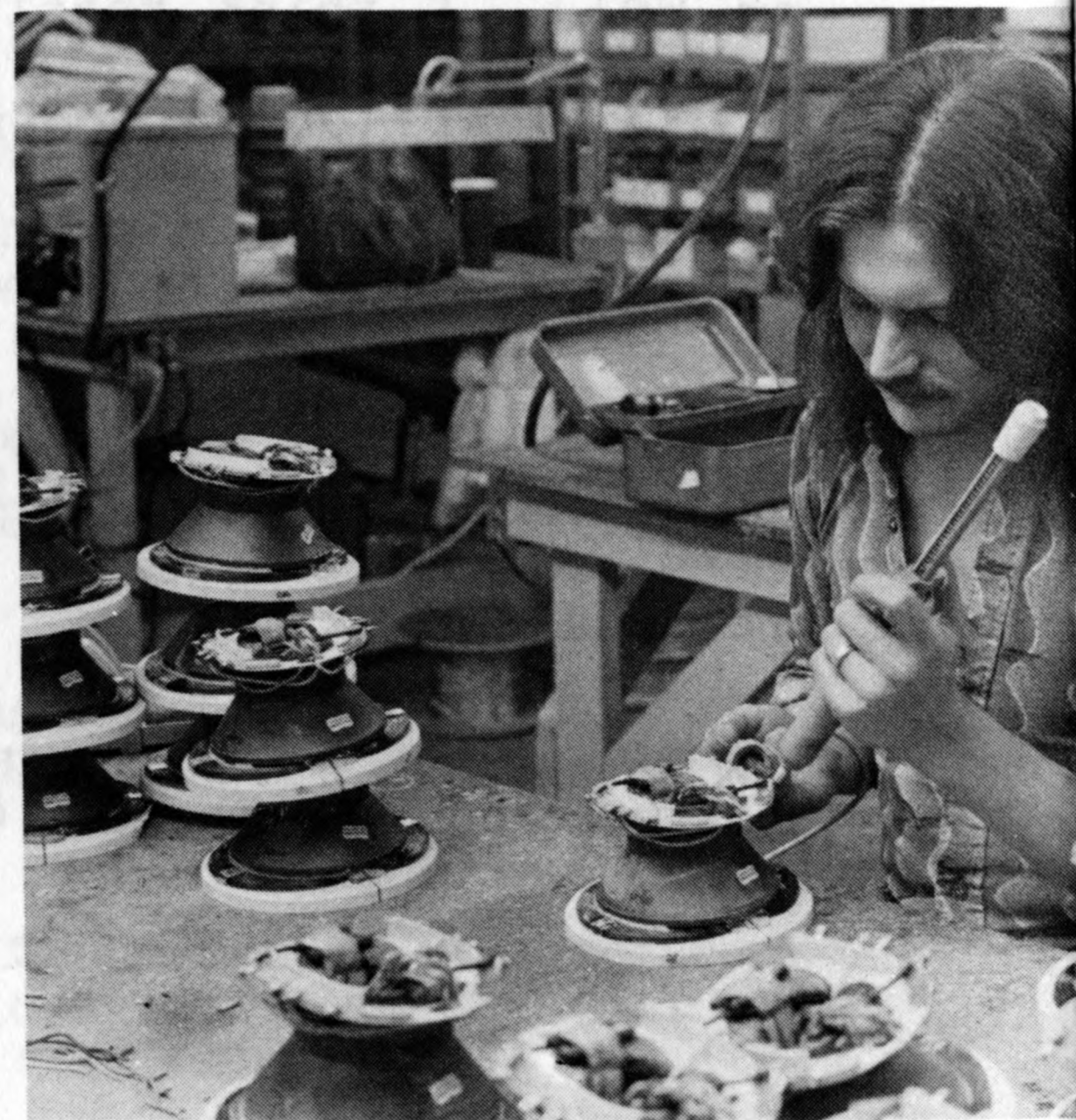
1. Building Printed Circuit Boards (PCBs)



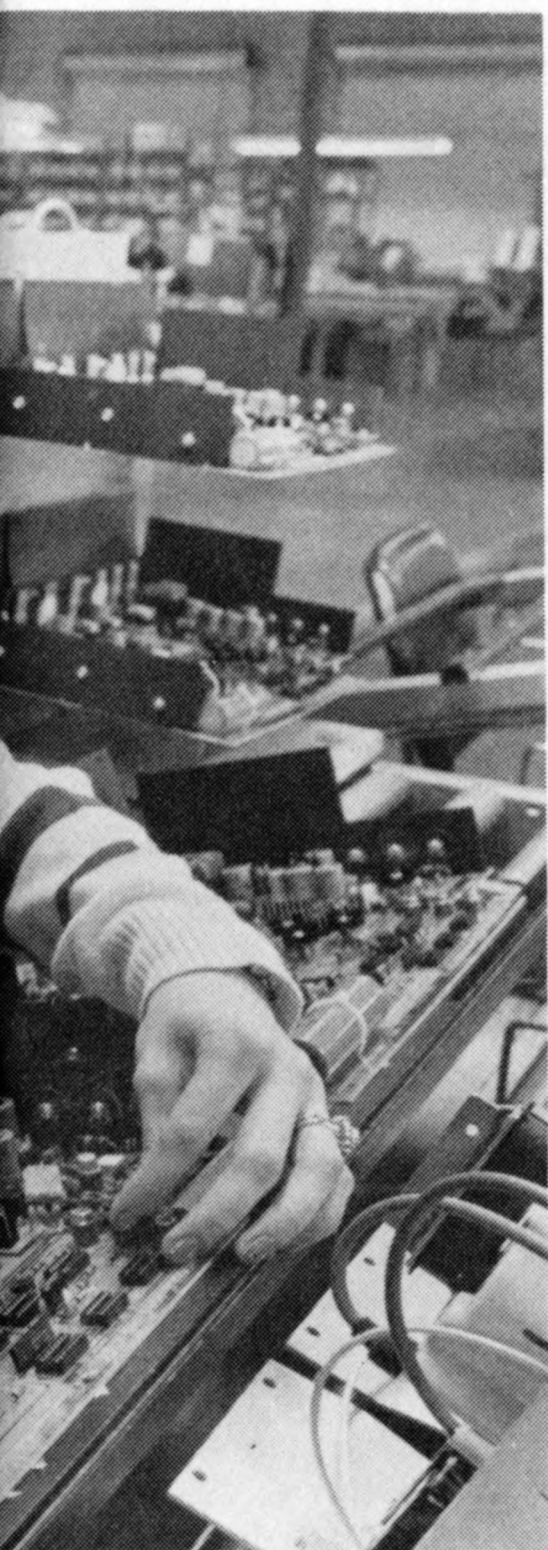
2. Preliminary or first Quality Control (QC) check to see that everything is in its proper place



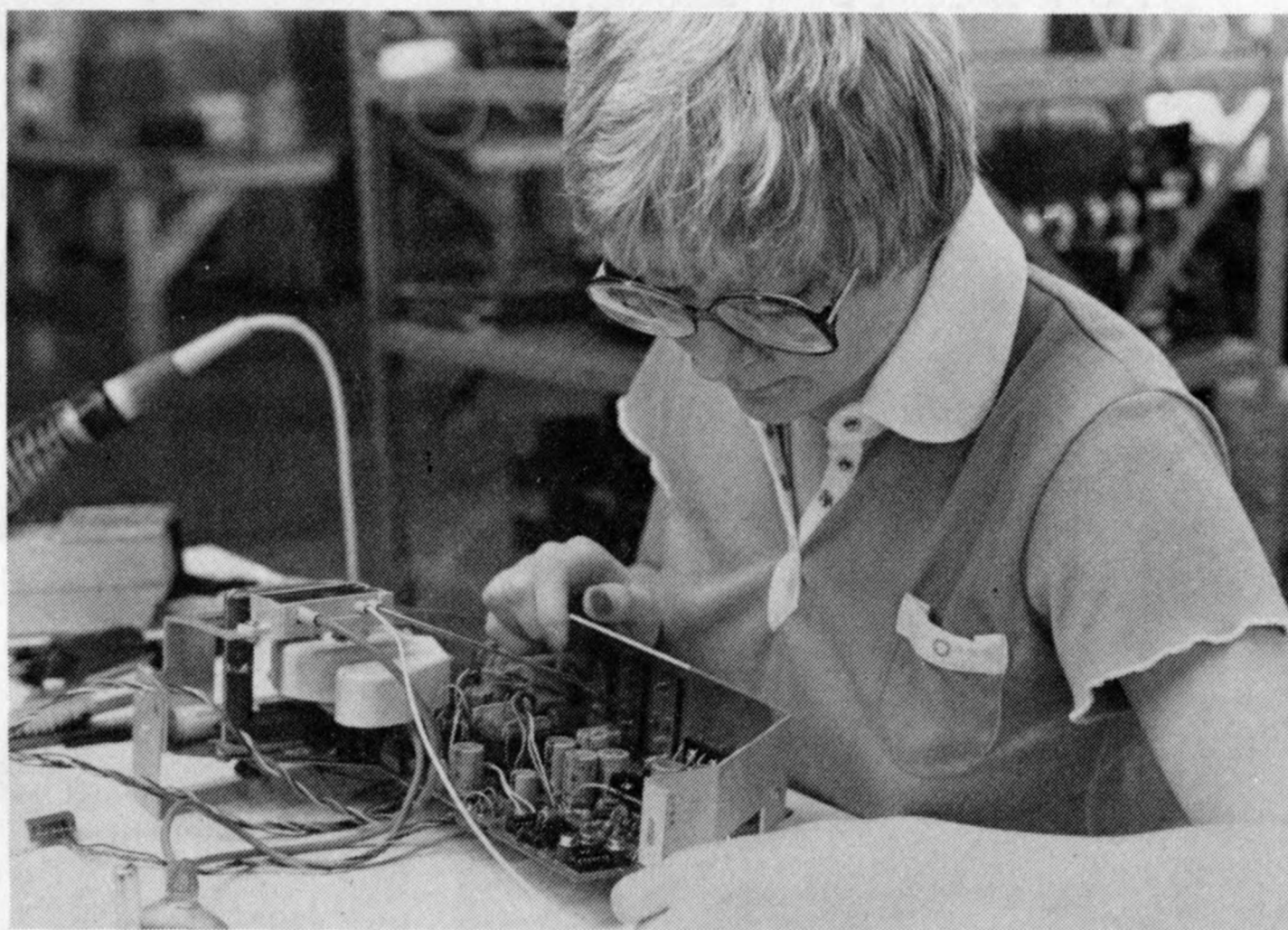
5. Keyboard Assembly. Here, the key caps are put on the switches.



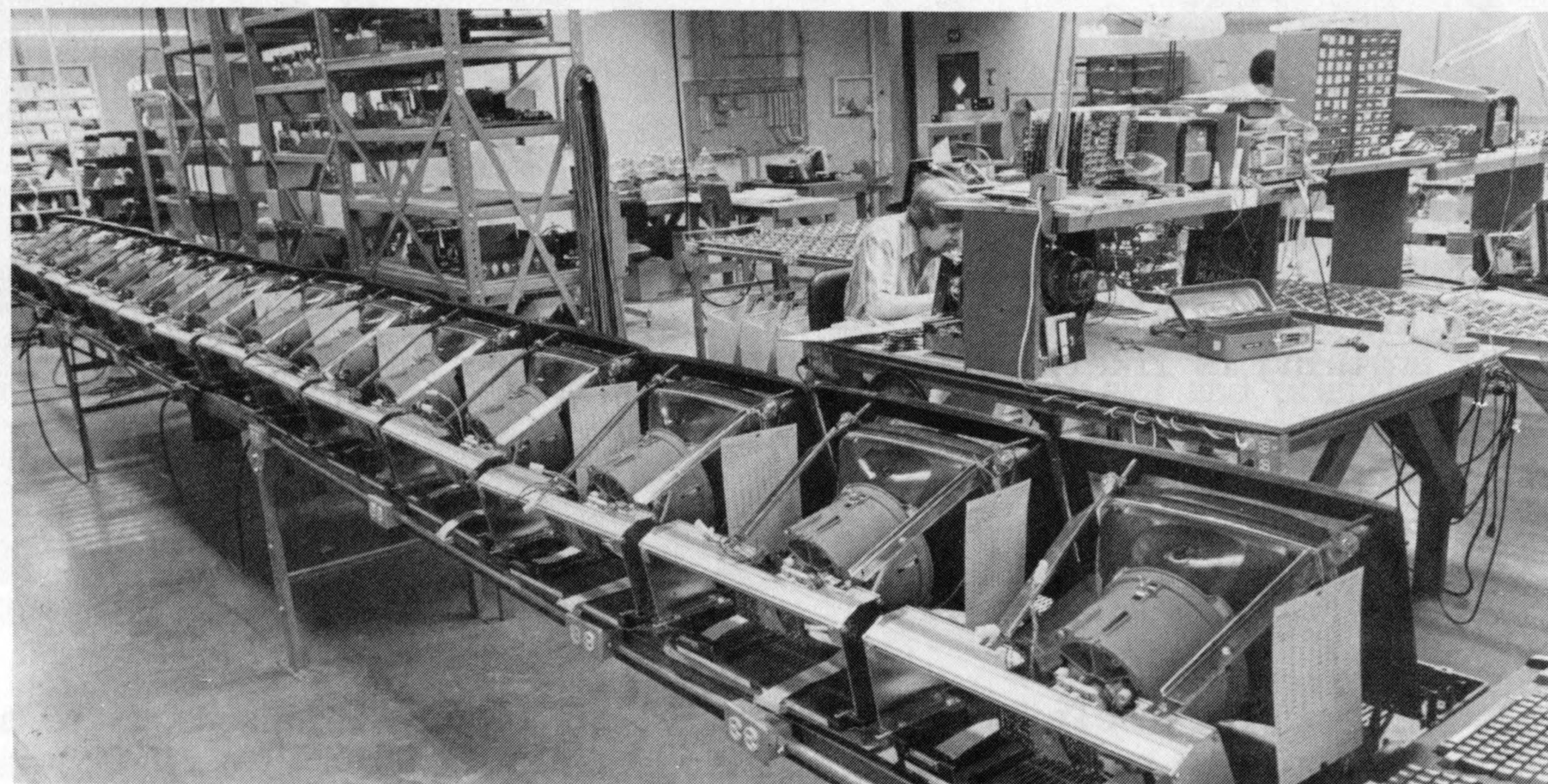
6. Subassembly. Putting the parts together.



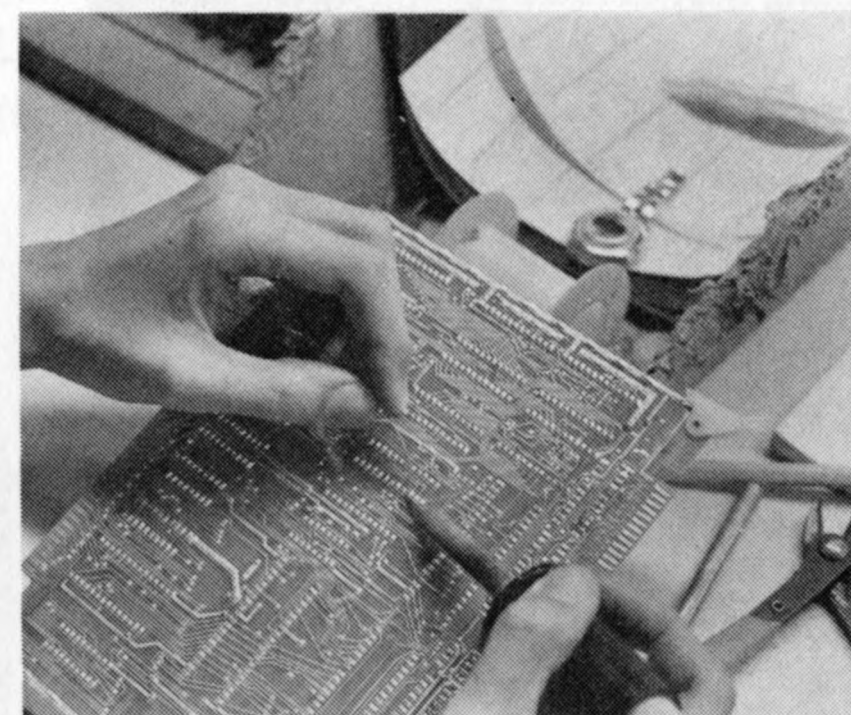
3.



7. Final Subassembly QC



Photos by John Clower



4.

3. Wave Solder

a. the Board is first coated with flux, and then

b. heated, soldered, and

c. the wires are trimmed. After this process has been completed, the Board is resoldered and then

d. washed,

4. The Cleanup Line washes the Boards again and retouches the soldering before technicians test them.

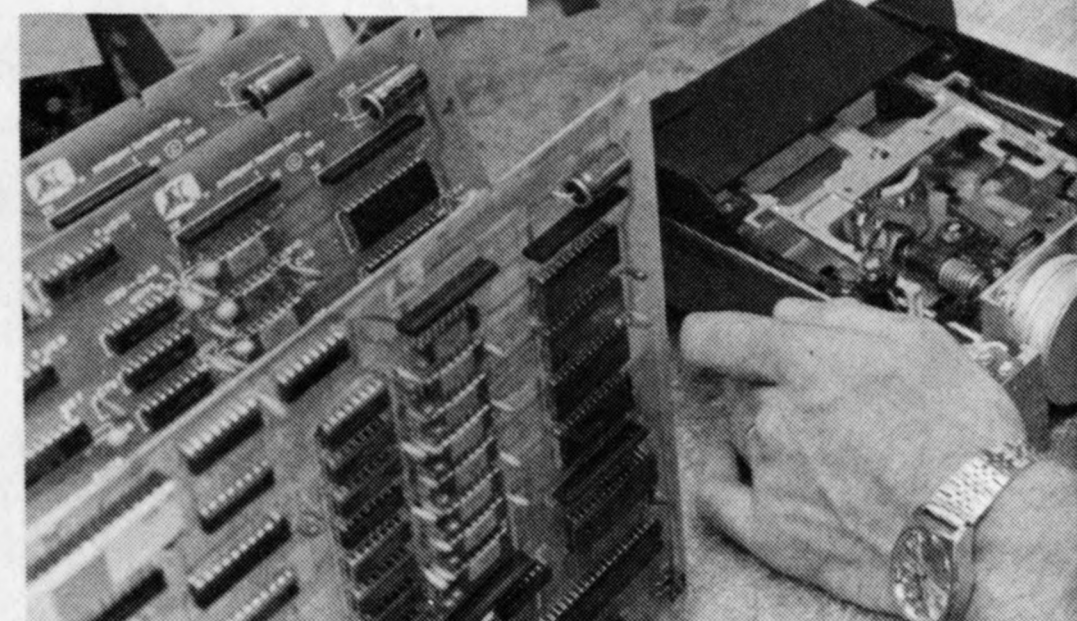
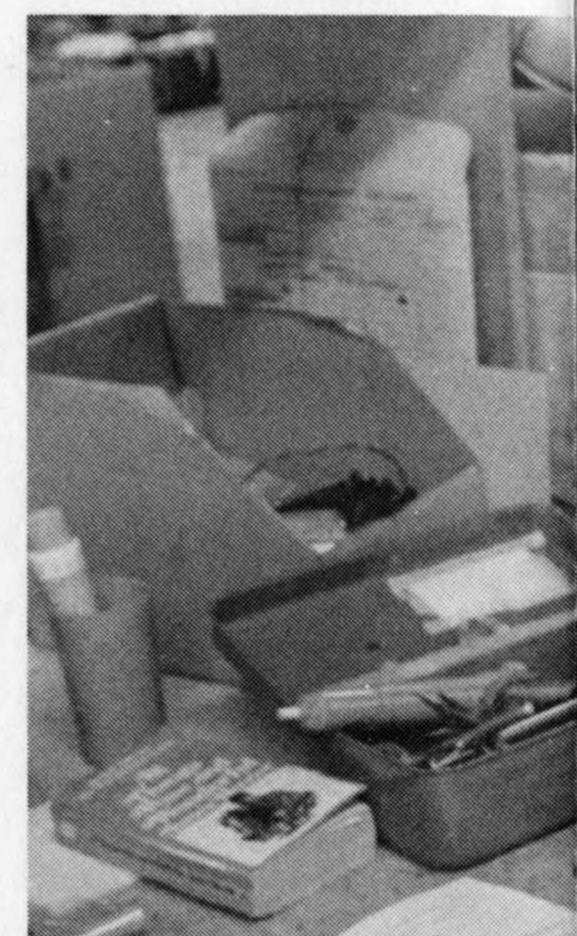
FINAL ASSEMBLY



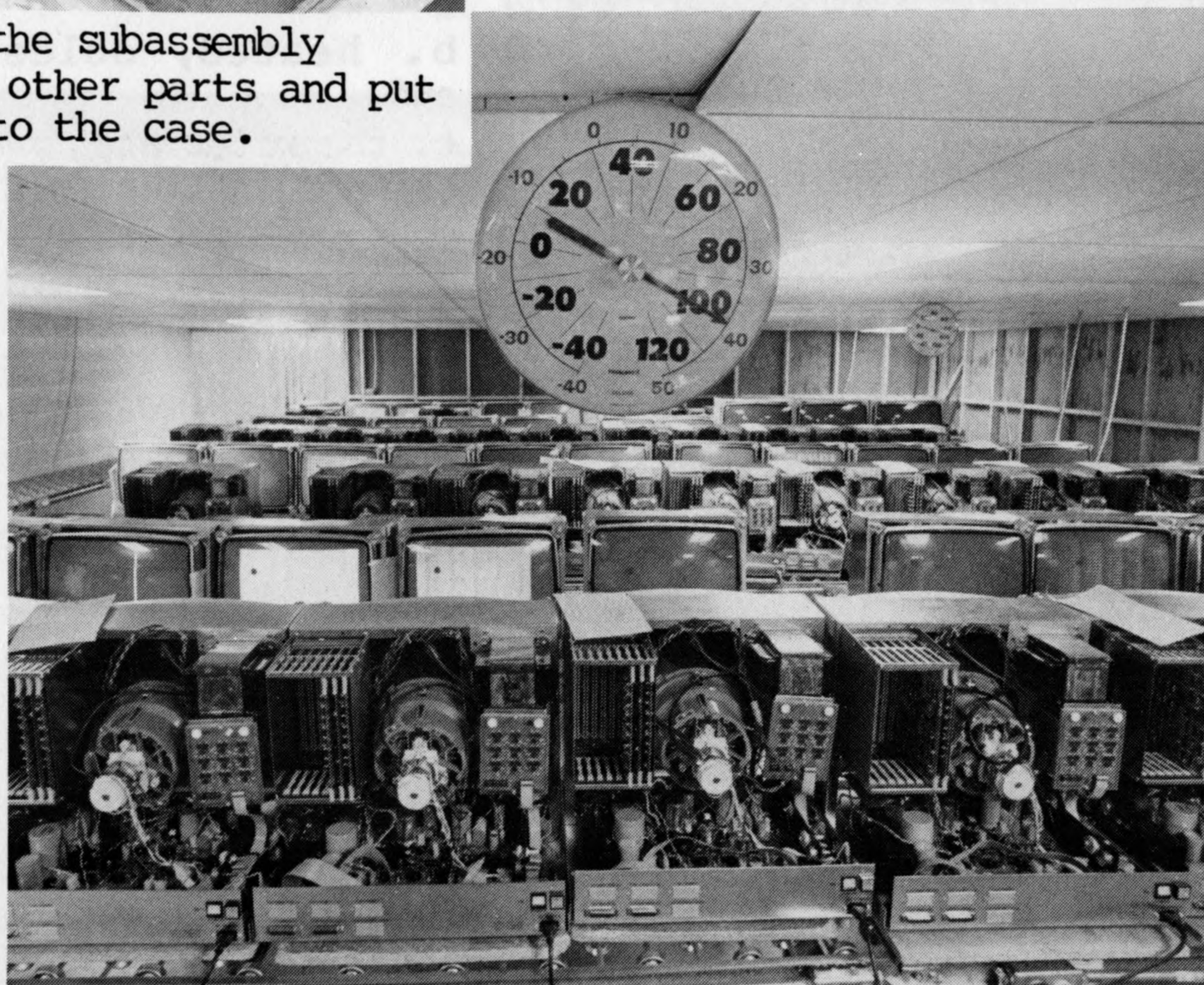
8. Get the subassembly and all other parts and put them into the case.



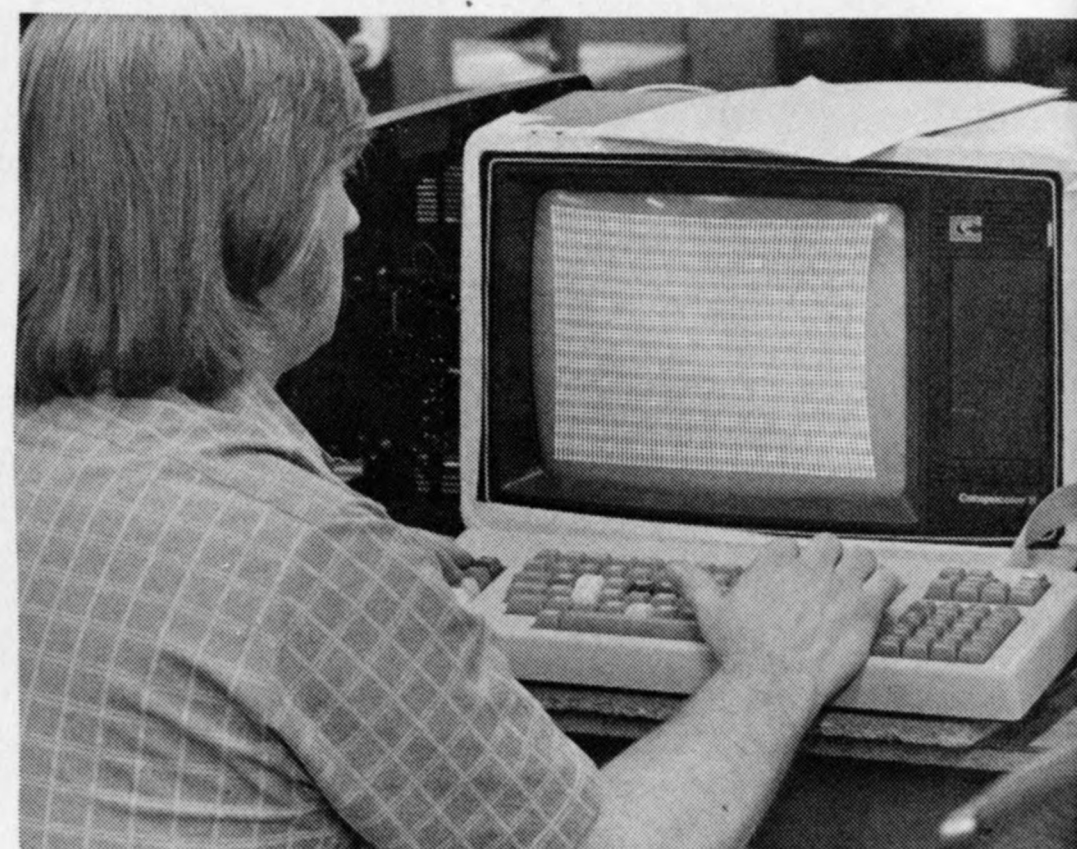
9. First Power Up. Testing tubes after final assembly.



10. Assemble disk drives.



13. Now the whole unit goes into the Burn In Room and bakes at 100 to 105 degrees for 3 days. If anything is likely to go wrong, it goes wrong here!

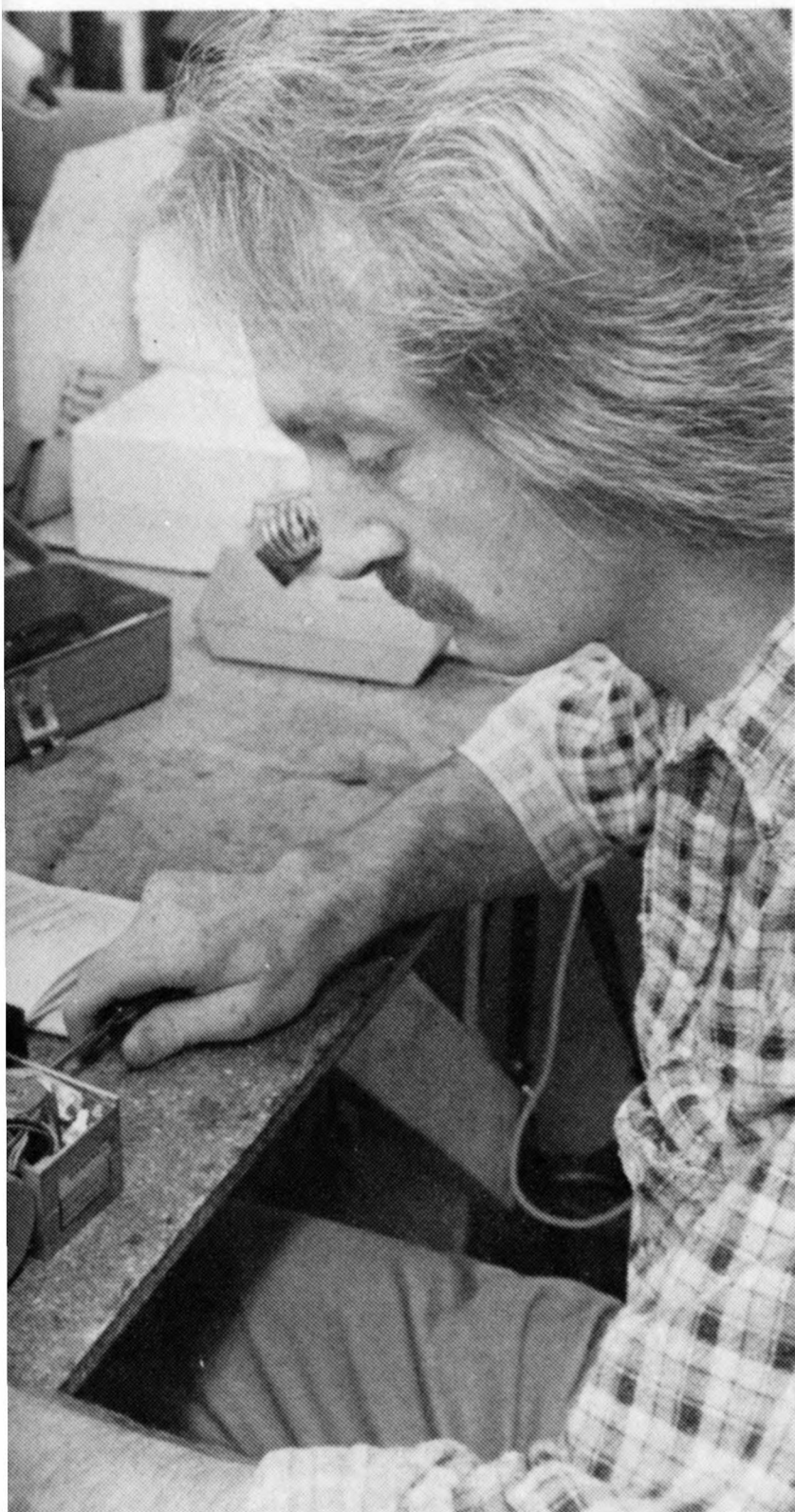


14. Final QC, then

The whole process takes 10 to 14 days. It requires a total of 20 people to put each Compucolor together.

If your machine should ever need to come back to the factory for repair, once the problem is identified and fixed, the Compucolor must go back through the whole testing process again.

12. Power Quality Control -- shake, rattle, and roll. The machine is shaken on a motorized table while the power is on -- great for finding loose connections.



11. Burning In (testing) drives.



12



16. The Disk Drive Department duplicates CompuColor program disks and prepares them for mailing.



15. Onto the Shipping Line.

Notice that the CompuColors in production are kept on wooden boards as they move down the production line. The CompuColor will experience external disk read problems when placed on a metal surface or near other metal objects or units. In addition, place your external disk on the RIGHT SIDE OF YOUR UNIT. The high voltage supply is located on the left side and will affect disk drive operation.

EDITOR'S NOTE

Computers are delicate machines. We at Compucolor can't be responsible for any complications resulting from hardware modifications. Please be sure to read your Maintenance Manual carefully before making any modifications.

GENERATING A BREAK

By Trevor Taylor
200A Foxridge Apts.
Blacksburg, Va. 24060

Anyone who has used their CCII as a communications terminal on an IBM, Honeywell or any other mainframe, will have run into an annoying problem: the BREAK key does not generate a break! Perhaps in the next version of FCS, Compucolor will fix this. Anyway, for my work, a BREAK key is essential, so I built one.

What is a break anyway? A break is not a character, it has no ASCII code! A break is simply a long string of zero bits -- many more bits than go to make up a single character. The computer at the other end recognizes this as a demand for attention because it has no valid stop bit.

This suggests a simple method for generating breaks. What if we put a switch in the transmitted data line that we could switch over to zero momentarily, then back to normal communications?

I bought a momentary contact (spring return) SPDT toggle switch at my local Radio Shack store (part no. 275-619 SPDT), and after a little soldering, I had a break "key" (really a switch). It only took about 10 minutes and cost less than \$2.

The procedure is simple, but you need a soldering iron and must be able to use it without making blobs of solder or melting the modem plug.

1. Pull apart the 25-pin plug that connects to your modem.
2. If you look carefully beside the pins, you will see little numbers. Find the one numbered 2 and unsolder the wire. Just touch the iron on it and pull (it helps to have three hands) - don't burn it off!
3. Cut three (3) pieces of wire long enough to reach from your modem to the CCII. Solder the first of these to the now vacant pin 2.
4. Solder the other end of this first wire to pin B (center pin) on the toggle switch.
5. Take a second piece of wire and solder it to pin A on the switch. Be careful to hold the toggle switch as shown in the diagram.
6. Remember that loose wire from the modem plug? Solder it to the wire connected to pin A of the switch. You will definitely want to insulate this joint with tape so it will not touch anything.
7. Solder the third piece of wire to pin C on the switch.
8. Now comes the hardest part, but luckily it's the last part too. Choose either pin 4 or pin 20 on the modem plug (pin 20 is probably easier). There should already be a wire attached. What you have to do is solder the third wire to this pin WITHOUT disconnecting the wire that is already there.


```

JNZ BTALoop ; CONTINUE PROCESS
CMP H ; UNTIL WE GET A
JNZ BTALoop ; ZERO QUOTIENT
INX B ; PT AT HIGHEST ORDER DIGIT
MOV H,B
MOV L,C
CALL OSTR ; SEND TO SCREEN
RET

```

Note that I have used a buffer rather than sending data directly to screen. This is convenient since the smallest order digits are generated first. In certain cases, it might be more convenient to have a memory word set aside for 'BUFPTR', so that the beginning of the string in 'BUFFER' could be indicated.

Another commonly needed routine is conversion of an ASCII string representing an integer into binary, i.e. the reverse of the above. One could read the string into a buffer and procede to multiply each digit by 10 and add the next one. The program would be extremely similar to my binary-to-ASCII program. But, first each digit would have to be checked to ensure it actually is a digit and not some other character. Below is a routine which does the job. It calls the routine CI (described in **COLORCUE**, November, 1979). All characters are ignored except digits, backspace, and return. Also it won't allow more than 5 digits. I prefer this method rather than error messages, which often destroy a carefully designed display (particularly in games).

```

INBUFF: DS 6 ; ROOM FOR 5 DIGITS AND
; DELIMITER
LO EQU 3392H ; SEND CHARACTER TO SCREEN
; FROM A REG
MULHD EQU 3562H ; MULTIPLIES D-E BY H-L. HIGH
; WORD OUT IN D-E. LOW WORD
; OUT IN H-L
INASCNUM: LXI B,INBUFF; B-C INDEXES INBUFF
MVI D,5 ; MAXIMUM NO. OF DIGITS
IANLOOP: CALL CI ; GET CHARACTER FROM KEYBOARD
; INTO A
CPI 26
JZ BSPACE ; HANDLE BACKSPACE
CPI 13
JZ ENDIAN ; HANDLE RETURN
SUI 48 ; CONVERT ASCII TO DIGIT
JC IANLOOP ; NOT A DIGIT, SO BACK FOR MORE
CPI 10
JNC IANLOOP ; NOT A DIGIT, SO BACK FOR MORE
DCR D ; DECREMENT NO. OF DIGITS TO GO
JM TOOLONG ; TOO MANY DIGITS?
STAX B ; STORE DIGIT IN BUFFER
ADI 48 ; CONVERT BACK TO ASCII
CALL LO ; ECHO DIGIT
INX B ; POINT TO NEXT POSITION IN
; BUFFER
JMP IANLOOP ; BACK FOR MORE

```



```

STA CCOUNT      ; AND FIRST CHAR ON LINE
STA LCOUNT
LXI H,FPB1      ; POINT AT INPUT FPB
MOV M,A         ; OPEN THE FILE
CALL OPEN
JC EMES        ; POINT AT INPUT BUFFER
LXI H,IBUF      ; SAVE INPUT BUFFER ADDRESS
SHLD FPB1+FBUF
LXI H,1024      ; SETUP BUFFER SIZE
SHLD FPB1+FXBC
LXI H,FPB1      ; POINT AT INPUT FPB
CALL RWSEQI     ; REWIND INPUT FILE
STC             ; SET ERROR STATUS
CMC             ; SET NO ERROR STATUS
RET             ; RETURN

```

```

;
;
;
;
GTPRM
GETS THE PRINTER PARAMS

```

```

GTPRM:          CALL SCND      ; SCAN FOR DIGITS
RC              ; NO DIGITS
CALL GVAL       ; GET VALUE IN <A>
STA LSIZ       ; LINE SIZE
CALL SCND      ; MORE SCAN
RC              ; NO DIGITS
CALL GVAL       ; NEXT VALUE
STA PSIZ       ; PAGE SIZE
CALL SCND      ; SCAN SOME MORE
RC              ; NO DIGITS
CALL GVAL       ; WHITE SPACE
STA WHITE
RET

;
;
;
SCAN PAST SPACES AND COMMA FOR DIGIT

```

```

SCND:           INX H
MOV A,M         ;
CPI ' '         ;
JZ SCND         ;
CPI ','         ;
JZ SCND         ;
CALL DIG        ; ?DIGIT <C>=YES
CMC             ; <NC>=YES
RET             ;

;
;
;
GETS VALUE FROM BUFFER TO <A>

GVAL:          MVI B,0      ; CLEAR <B>
CALL G01        ; GET SUM IN <B>
MOV A,B         ; TO <A>
STC             ; SET CARRY
CMC             ; SET <NC> FOR ERROR
RET             ;

G01:           MOV A,M      ; GET DIGIT
SUI '0'         ; CHECK IF 0-9
RC              ; NO
CPI '9'+1       ; NO
RNC             ; BACK TO MEM
MOV M,A         ; GET CURRENT SUM
MOV A,B         ; *2
RLC             ; *4
RLC             ; *5
ADD B           ; *10 FOR SUM
RLC             ; ADD DIGIT
ADD M           ; SAVE IN B
MOV B,A         ; POINT TO NEXT DIGIT
INX H
JMP G01

```



```

;COMPUCOLOR DEMO CI ROUTINE
;THIS SHOWS HOW TO READ A CHARACTER
;AND ESCAPE FROM A HUNG PROGRAM

;
; CHROUT IS CALLED WHENEVER A KEY IS STRUCK
; THE JUMP IS FROM INPCRT BUFFERS AHEAD FOR
; CI TO GET CHAR WHEN IT WANTS IT

CHROUT:  CALL  SAVE
         LXI  H,INBUF
         MVI  A,30
         CMP  M
         RC   M
         INR  M
         MOV  A,M
         CALL ADHLA
         MOV  A,E
         CPI  27
         JZ   BREAK
         ANI  127
         MOV  M,A
         RET

; BREAK ALLOWS THE USER TO BRANCH TO A LOCATION WHEN THE
; ESCAPE KEY IS STRUCK. IN THIS CASE THE LOCATION IS
; CALLED BAILOUT.

BREAK:   JMP  BAILOUT

INBUF:   DS   32      ;STORAGE AREA FOR TYPE AHEAD
;
; CI READS AND ECHOS ONE CHARACTER
;

```

```

CI:  PUSH  H
     LXI  H,INBUF
     MOV  A,M
     ANA  A
     JZ   C11
     DI
     PUSH D
     DCR  D
     MOV  D,M
     INX  H
     MOV  A,M
     DCX  H
     MOV  M,A
     INX  H
     JMP  C12

C11:  MOV  A
     C11
     ; LOOK AND WAIT IF ZERO
     ; HOLD OFF INTERRUPTS WHILE PROCESSING
     ; SAVE D
     ; REDUCE BUFFER COUNTER
     ;
     ; POINT TO CHARACTER
     ; READ IT
     ; STACK IT
     ; PACK TYPE AHEAD BUFFER
     ; WHEN DONE
     ; CHARACTER TO BE SHIFTED
     ; POINT TO NEW HOME
     ; NEW HOME
     ; LOOP UNTIL DONE

C12:  DCR  D
     JM   C13
     INX  H
     MOV  A,M
     DCX  H
     MOV  M,A
     INX  H
     JMP  C12

C13:  EI
     POP  PSW
     PUSH PSW
     CALL CO
     POP  PSW
     POP  D
     POP  H
     ; ENABLE INTERRUPTS
     ; THE CHARACTER
     ; SAVED AGAIN
     ; DISPLAY
     ; BACK HOME
     ; <DE> AND <HL>
     ; UNCHANGED

S1OUT: IN   IN
        03H      ; EXACT COPY OF ROM ROUTINE
        ; SHOWS CLEAR-TO-SEND HANDSHAKE
        ; TBUFFER EMPTY?
        ; NO
        ; CLEAR TO SEND OK?
        ; (USES BIT 7 OF EXTERNAL INPUTS)
        ANI  80H

```



```

JZ      SLOUT      ; NO, WAIT FOR CLEAR TO SEND
MOV     A,E        ; SEND IT
OUT     06H        ; OUT
RET

ERROR:  LXI        H,MSG02      ; PRINT ERROR MESSAGE
CALL    OS         ; END OF FILE - EXIT
BAILOUT:MVI B,0     ; SETUP NO ERROR
EXIT:   LHLD       FCSSP       ; RESTORE FCS STACK
        SPHL
        RET

; ROM JUMP TABLES
OLDTAB: JMP 33F4H
        JMP 262DH
        JMP 3077H
        JMP 26A5H
        JMP 2DABH
        JMP 30C6H
        JMP 30E7H
        JMP 3136H
        JMP 322CH
        JMP 324AH
        JMP 3518H
        JMP 3FD0H
        JMP 3476H

; LENTAB EQU $-OLDTAB
; NEWTAB:

OS:     JMP 182AH
EMESS:  JMP 0AD6H

```

```

PFSPC:  JMP 14ADH
RESET:  JMP 0B48H
OPEN:   JMP 11E1H
RWSEQI: JMP 14FCH
INSEQO: JMP 151DH
CLSEQO: JMP 156CH
GTBYT:  JMP 1662H
PTBYT:  JMP 1680H
ADHLA:  JMP 194EH
SAVE:   JMP 0A2EH
DIG:    JMP 18ACH

; MESSAGES
MSG:    DW 0
MSG00:  DB 27,11,15,6,5,CR,LF,'PRINT '
        DB 6,7,'V2.0',13,10,239
MSG01:  DB 13,10,6,1,11,'< FILE
        NAME,#COL,#LINES,#LINES TOP MARGIN >'
        DB 6,5,CR,LF,'PRINT>',18,239
MSG02:  DB 17,'HARDWARE ERROR !',13,10,239

DEFAULT:DB 'SRC'

; DATA AREAS
ORG     (($/256)+1)*256 ; PUT ON EVEN PAGE
BUFFER: DS 256
IBUF:   DS 1024 ; INPUT BUFFER

        DS 300 ; STACK AREA
STACK:

FCSSP:  DS 2 ; FCS STACK POINTER
FPB1:   DS 38 ; INPUT FPB

        END START

```


input

Vinn Beigh Vinn Beigh, a student at the Illinois Institute of Technology, 1221 W. Glenlake Avenue Chicago, Illinois 60660 is looking for calculus, physics, and chemistry programs. If you have any information to offer, please contact him.

=

Myron Steffy has sent us a short utility program which lists variables in long programs in order of their appearance. He'd be happy to hear from you if you have any comments:

Myron Steffy Like a great many people, I sometimes fail to keep track of the variables as I use them, especially in one involving a lot of math. If you have this difficulty, simply append this to the main program. It will list all of the variables in order, including the ones used in the routine.

If you need to know where a certain variable is used, then FREDI goes to work. Ask him to look for the string "X=", or as the case may be. Be sure to put in the "=" sign or he will list every "X" in the text.

It should also be noted that the program that is being searched must be "run" first, or the variables will not have been stored.

```
30000 REM LIST VARIABLES IN THE ORDER THAT THEY APPEAR
30005 REM V1 IS THE START OF VARIABLES
30010 V1= PEEK (32982)+ PEEK (32983)* 256
30015 W1= PEEK (V1)
30020 W2= PEEK (V1+ 1)
30025 IF W1= 128THEN W3= 36
30030 IF W1> 175AND W1< 219THEN W1= W1- 128:W3= 36
30035 IF W2> 47AND W2< 91THEN PRINT CHR$ (W2);
30040 IF W1> 47AND W1< 91THEN PRINT CHR$ (W1);
30045 IF W3= 36THEN PRINT CHR$ (36)
30050 IF W3= 0THEN PRINT
30055 W3= 0
30060 V1= V1+ 6:REM JUMP TO NEXT VARIABLE
30065 REM V2 IS END OF VARIABLES
30070 V2= PEEK (32984)+ PEEK (32985)* 256
30075 IF V1< V2THEN 30015
30080 END
READY
```

=

R. G. Meister R. G. Meister writes to say that he has several astrology-related programs available. They are: MC FROM ARIES OR LIBRA; MC FROM CANCER OR CAPRICORN; GEOCENTRIC LATITUDE OF PLACE; ASCENDANT FROM ARIES; ASCENDANT FROM CANCER; ASCENDANT FROM LIBRA; ASCENDANT FROM CAPRICORN; RA OF NQ PLANETS (WITH ACCRUED PRECESSION); NEW DECLINATIONS OF NQ PLANETS; RISING, SETTING OF NQ PLANETS FOR PLACE. If you are interested, please contact him.



=

In our last issue, February 1980, Trevor and Denise Taylor offered to copy their Star Trek enhancement to your disk for you. Send them your copy of Star Trek and please remember to enclose return postage. Thanks.

=

Dave Suits, in his text **AN INTRODUCTION TO COLOR GRAPHICS**, writes:

Dave Suits
95 Castle Road
Rochester, N.Y. 14623

Although the CCI has eight background and eight foreground colors, even more colors are available under certain conditions. Look at the character associated with shift-@ (FLAG OFF):  (PLOT 96 also does it.) That little "hatch" character, like any other character, can be printed in any color on a background of any color. But, because the background shows through only between the hatches, the result is a new color which is a function of the foreground and background color combination. Use the PLOT 6 followed by a CCI code, followed by PLOT 96 (or PRINT"") and see what you can come up with. The program below will display all the possibilities.

```
5 REM PROGRAM 2.6
6 REM THE HATCH CHARACTER
10 PLOT 27,24: REM PAGE MODE
20 PLOT 30,16,29,16: REM SET COLORS
30 PLOT 15,12: REM SMALL CHARACTERS; CLEAR SCREEN
37 REM PRINT HEADINGS AT TOP. THE NUMBERS UNDER
38 REM 'BG' AND 'FG' ARE BACKGROUND AND FOREGROUND
39 REM COLORS FROM BLACK (16) TO WHITE (23)
40 FOR X=6 TO 54 STEP 16
50 PLOT 3,X,0: PLOT 17: PRINT "BG";: PLOT 22: PRINT "FG"
60 NEXT: PRINT
69 REM INITIALIZE BACKGROUND (BG) AND FOREGROUND (FG) TO BLACK
70 BG=16: FG=16
79 REM PRINT 4 COLUMNS IN 31 ROWS OF THE HATCH CHARACTER
80 FOR X=0 TO 48 STEP 16
90 FOR Y=1 TO 31 STEP 2
100 FG=FG+1: REM NEXT FOREGROUND COLOR
110 IF FG=24 THEN FG=16: BG=BG+1: REM NEXT BACKGROUND COLOR
120 IF BG=24 THEN X=48: Y=31: GOTO 170: REM ALL DONE
130 PLOT 30,BG,29,FG,3,X,Y: REM SET COLOR & CURSOR
140 PLOT 96,96,96,96,25: REM 4 HATCHES, THEN MOVE OVER
150 PLOT 6,1: PRINT BG;
160 PLOT 6,6: PRINT FG
170 NEXT Y,X
180 PLOT 6,2,3,48,31
190 INPUT "WAITING...";A$: REM WAIT UNTIL 'RETURN' IS PRESSED
200 PLOT 27,11
```

=

attn/break

EDITOR'S NOTE The December/January issue contained some errors in Ben Barlow's "Talking to Other Computers" article -- my old eyes aren't what they used to be. The following lines of code are correct (I hope!). Changes are to the BASIC data statements in lines 10, 12, and 20. Delete the final 32 in the Assembly data statement. Thanks, to those of you who corrected me.

BASIC version:

```
5 POKE 32940,195:POKE 32941,159
6 CLEAR 200
10 DATA 245,123,230,127,254,127,202,235,159,254,10,202,230,
    159,254,13
12 DATA 202,230,159,254,32,218,235,159,254,97,218,230,159,
    230,223,50,1
13 DATA 112,95,241,195,220,57
20 DATA 241,201,245,62,31,50,227,129,62,132,211,5,62,14,50
    223,129,241,201
30 DATA -1
50 FOR X= 40900TO 40999
60 READ A:IF A= -1THEN X= 41000:GOTO 100
70 POKE X,A
100 NEXT
120 POKE 33221,195:POKE 33222,196:POKE 33223,159
130 POKE 33215,195:POKE 33216,237:POKE 33217,159
READY
```

Assembly version:

```
9FD7 FE20      CPI      20H; replaces CPI 20 in original

245 123 230 127 254 127 202 235 159 254 10 202 230 159 254 13
202 230 159 254 32 218 235 159 254 97 218 230 159 230 223 50 1
112 95 241 195 220 57 241 201 245 62 31 50 227 129 62 132 211
5 62 14 50 223 129 241 201
```

=

Also, in the Graphics issue, on page 26 where we were discussing the Handshake Modification, please change instruction 3 to read "Tie UCl Pin 4 to UE1 Pin 10" (not UCl Pin 10) and change instruction 4 to read "Add a 10K 1/4 W resistor between UD1 Pin 4 and 12V [R10]" (12V rather than H2V.) This modification works well on Centronics and Centronics-type printers but not on BASE₂ Model 800 and MPI printers. Please accept my humble apologies for any confusion this may have caused.

=

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NOTE: THIS IS THE PRINTER DRIVER PROGRAM. IT WAS INADVERTENTLY LEFT OUT OF THE REDUCED COPY. IT SHOULD BE INSERTED IN PAGE 20, COLUMN 1, JUST BEFORE IBUFF: PRINT MESSAGE AND INPUT BUFFER WITH BACKSPACE EDITING.

```

;*****
;
; PRINTER DRIVER FOR SIMPLE MINDED PRINTERS
; USING CLEAR-TO-SEND
;
; EXPANDS TABS
; NOTICES #CHARS ON LINE
; AND #LINES ON PAGE

PRINT:  CALL  SAVE      ; SAVE ALL
        CPI    FF       ; FORM FEED?
        JZ     FFEED    ; DO IT
        CPI    TAB      ; SEE IF TAB
        JZ     TABOUT   ; SEND BLANKS FOR DUMB PRINTERS
        CPI    LF       ; LF? END OF LINE
        JNZ    COUNT    ; NO PRINT IT
        CALL   IBM      ; PRINT IT ANYWAY
        LXI    H,CCOUNT; RESET CHAR COUNT
        MVI    M,0      ; TO ZERO
        LXI    H,LCOUNT; GET LINE COUNT
        INR    M        ; BUMP IT
        LDA    WHITE    ; GET MARGIN SIZE
        MOV    B,A      ; SAVE IT
        LDA    PSIZ     ; GET PAGE SIZE
        SUB    B        ; SUB MARGIN
        CMP    M        ; THERE YET?
        RNZ     ; NO THATS ALL TO DO
        CALL   MARGIN   ; YES - SEND SOME BLANK LINES
        MVI    M,0      ; NOW AT TOP OF THE PAGE
MARGIN:  LDA    WHITE    ; AND SOME MORE BLANK LINES
MRG01:  PUSH    PSW      ; SAVE COUNT
        MVI    A,LF     ; KEEP THOSE LINE FEEDS
        CALL   PRINT    ; GOING OUT
        POP    PSW      ; RECOVER COUNT
        DCR    A        ; TILL WE HAVE ENOUGH MARGIN
        JNZ    MRG01    ; KEEP IT UP
        RET            ; WHEW! ALL THIS FROM ONE CHAR!

FFEED:  MVI    A,LF     ; FORM FEED BBY LINE FEEDS
        LXI    H,LCOUNT; COUNT IT
        INR    M        ; ONE MORE LINE
        LDA    PSIZ     ; SEE IF END OF PAGE
        XRA    M        ; TRICKY ZERO <A> IF SAME
        JNZ    FFEED    ; NO
        MOV    M,A      ; YES, USE TRICKY ZERO
        JMP    MARGIN

COUNT: CALL   IBM      ; SEND IT
        LXI    H,CCOUNT; ONE MORE CHAR ON THIS LINE
        INR    M

```



```

LDA    LSIZ    ; MAX LINE SIZE
CMP    M       ; OUR COUNT
RNZ    ; FORCE LF
MVI    A,CR    ; SEND CR
CALL   PRINT   ; SEND LF, RESET COUNT
MVI    A,LF    ; TEST FOR END OF PAGE, ETC
JMP    PRINT   ; AND RETURN

TABOUT: MVI    A,''    ; SEND SPACES
CALL   PRINT
LDA    CCOUNT  ; TILL CCOUNT=
ANI    7       ; EVEN MULTIPLE OF 8
RZ
JMP    TABOUT

;      DATA AREA PRINTER DRIVER
;
CCOUNT: DB      0    ; CURRENT CHAR COUNT
LCOUNT: DB      0    ; CURRENT LINE COUNT

;      RUN TIME PRAMS - DEFAULT VALUES
;
LSIZ:   DB      80    ; MAX CHAR ON LINE
PSIZ:   DB      66    ; MAX LINES ON PAGE
WHITE:  DB       3    ; NUMBER OF BLANK LINES AT TOP
                        ; OF PAGE

;      END SIMPLE MINDED PRINTER DRIVER
;
;*****

```


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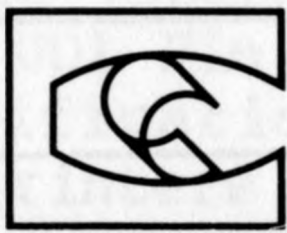
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